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EXAMINATION OF THE MANNER IN WHICH PRICES OF NATURAL COMMODITIES AND THEIR SYNTHETIC COMPETITORS COULD REFLECT ENVIRONMENTAL COSTS, TAKING INTO ACCOUNT POLICIES RELATING TO THE USE AND MANAGEMENT OF NATURAL RESOURCES AND SUSTAINABLE DEVELOPMENT

Sustainable development and the possibilities for the reflection of environmental costs in prices

Report by the UNCTAD Secretariat

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I. INTRODUCTION

1. The aim of this report is to contribute to the discussions by the Standing Committee on Commodities on the "examination of the manner in which prices of natural products and their synthetic competitors could reflect environmental costs, taking into account policies relating to the use and management of natural resources and sustainable development". This discussion can also be considered as a follow-up to Principle 16 of the Rio Declaration on Environment and Development which states that "national authorities should endeavour to promote the internalization of environmental costs and the use of economic instruments, taking into account the approach that the polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment" (A/CONF.151/26 (Vol.I)). This view has been reiterated or reflected, sometimes through references to economic instruments, in many decisions by a wide variety of stakeholders, from Governments to businesses and from academics to non-governmental organizations.[1]

2. In spite of the wide acceptance of the importance of internalization of environmental costs and of the use of economic and other measures in the pursuit of sustainable development, the application of this principle is not yet widespread. This appears to stem from a variety of considerations, an important (and in many cases the principal) one relating to concerns about loss of competitiveness in international markets. The reference in Principle 16 of the Rio Declaration to maintaining international trade and investment patterns reflects this concern.[2] In this light, this report is concerned with the reflection of internalized environmental costs in *international* prices and focuses on tradable commodities.

3. After this introduction, in chapter II the report covers development-related concerns, including income and foreign exchange constraints, which cause internalization in the commodity sector to be a very complex and demanding, sometimes even a controversial, undertaking. It also discusses the burden of non-internalization by providing relevant empirical estimates.

4. Chapter III starts with the observation that the internalization of environmental costs in the countries producing the commodities concerned, which

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[1] For example, at its third session, the Commission on Sustainable Development, in its decision on "Financial resources and mechanisms", emphasized that future discussions "should explore ways and means of overcoming obstacles" to the implementation of economic instruments with particular attention paid to specific country situations and the phasing out of environmentally unfriendly practices, as well as to problems of capacity building in developing countries and distributional problems" (UN Commission on Sustainable Development, paragraph 14). The present report addresses several of the issues raised in that decision.

[2] The view on international trade patterns which is adopted in this report is that these patterns may, and strictly speaking, should, change as a result of reflecting environmental costs in the prices of natural products and their synthetic substitutes. Nevertheless, measures can, and should, be adopted to alleviate the legitimate concerns of developing countries which may prevent them from pursuing internalization policies that would ensure the introduction of environmental concerns into decision-making processes.

would be pursued in order to promote sustainable development, is not uniquely co-terminous with the reflection of these costs in prices: many other mechanisms exist for such internalization. It reviews the special conditions in international commodity markets, including stiff competition among producers of homogeneous commodities, the widespread use of subsidies, and the existence of substitutes, which makes the price route a very difficult one if internalization policies are pursued unilaterally by individual countries.

5. Chapter IV focuses on international cooperation on cost internalization. It starts with a discussion of international actions which can improve the possibilities for a reflection of environmental costs in prices. However, if the main aim is the pursuit of sustainable development, then in situations when such reflection is not possible, it becomes necessary to address - and this is done here - the question of what can be done internationally to facilitate internalization of environmental costs, which is a key element in this pursuit. In this respect, a case is made for the provision of finance to help in the adoption of environmentally preferable production practices. The chapter also includes a brief discussion on some institutional arrangements that can be visualized for both reflection of environmental costs in prices and for the provision of finance.

6. Finally, chapter IV makes some suggestions on possible steps to be taken for furthering work on internalization of environmental costs, and draws some practical conclusions for international cooperation in this area, with specific reference to the role of UNCTAD.

II. Developmental context of internalization

7. The agenda item treated in this study conflates two conceptually distinct issues: the issue of internalization per se, particularly in the context of developing countries, and that of reflecting internalized costs in the prices of primary commodities. Chapter III will discuss in detail the second of these issues; the present chapter is devoted to an examination of the particular characteristics of developing countries which impact on the possibilities they have to effect internalization, whether or not ultimately reflected in the prices of the primary commodities they produce and export.

8. Internalization of environmental costs and benefits takes place in the context of policies relating to the use and management of resources. These policies differ from country to country. These differences depend on various factors, including the development needs of each country, the environmental absorptive capacity of the country and the time preferences involved. In this respect, another important factor is the importance attached to preserving the natural resource base, including air, water, soil and biodiversity. If a Government believes that a natural resource can be substituted by other natural or man-made resources, there will be less attention paid to preserving it. If, however, faith in such substitution is believed to be unwarranted, prevention of environmental degradation or preservation of natural resources will be given a higher priority, and attempts at internalization will be stronger.[1]

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[1] For a succinct discussion of the concepts of weak and strong substitutability, see Opschoor, J.B. (1994), pp. 3-4.

A. Pattern of production, economic growth, income and employment

9. In the absence of internalization of environmental costs and benefits, economic calculations are incomplete. Only part of the total costs and benefits to the society are taken into account, and a wedge is driven between the private and social costs and benefits of production and consumption activities. Since external costs are not paid and external benefits are not obtained, producers and consumers do not receive the correct signals about the scarcity of the resources they are using up or the environmental damage (or benefit) they are causing. Incorrect decisions are taken as regards resource allocation. Too many resources are allocated to activities that generate external costs, and too few resources are allocated to activities that generate external benefits. Commodities that are resource-depleting and environment-polluting are over-produced and over-consumed while those which are resource-saving or environment-friendly are under-produced and under-consumed. A socially undesirable pattern of production and consumption is thereby attained (Panayotou, 1995, p.5).

10. In principle, measures to internalize environmental costs should not be constrained by the inability to reflect them in prices. The objective of internalization is the incorporation of external costs and benefits into the decision calculus of economic agents (producers and consumers) in order to alter their behaviour towards a socially optimal production and consumption mix. In developing countries, however, poverty alleviation and development in general have an important role in the social welfare function defining this optimum, and foreign exchange earnings represent an essential factor in this respect.

11. Accordingly, development policy objectives and priorities, such as economic growth, foreign exchange generation, equitable income distribution, employment creation and increasing competitiveness, naturally have a bearing on the weight given in the overall policy mix to environmental issues, the implementation of internalization policies, and the actual selection and combination of internalization instruments.

12. The link between internalization and economic growth is twofold: instruments that restrict or constrain economic growth conflict with developing countries' priorities; and economies which are stagnant are less able to implement internalization policies (UNCTAD, 1995c, p. 77). Growing economies are in a better position to bring about the necessary shifts in resources, employment and government revenue in order to accommodate environmental objectives (Welfens, p. 232). In particular, economic growth goes hand in hand with increases in capital stock and expanding production in the commodity sector, as well as in other sectors. It is easier to induce switching to cleaner production processes when new activities are being started. Likewise, expanding economies can be more innovative than stagnating ones.

13. Although so far, in the absence of environmental considerations, such diversification and expansion of production has often been environmentally harmful, recent experience shows that environmental damage is not a necessary component of development in the commodity sector. The introduction of Integrated Pest Management (IPM) in Indonesia has reduced the application of pesticides and has been supplemented by crop rotation with leguminous plants and the presence of nitrogen-fixing algae in the paddies. Furthermore, pest-resistant varieties

have been introduced on a large scale. Since the introduction of IPM in Indonesia at the end of 1986, the use of pesticides there has declined by 90 per cent, whereas yields have increased by about 10 per cent.

14. Coupled with the high price elasticities of demand that individual countries face, which make it difficult to shift some of the burden of internalization to the consumers (as discussed in chapter III), the general characteristics of many developing countries also create impediments to internalization of environmental costs and benefits in their commodity sectors.

15. Firstly, many of these countries are highly dependent on one or a few commodities for the bulk of their export earnings. Any decline in exports as a result of internalization policies would therefore be a severe blow to their development efforts.

16. Secondly, the very low levels of income of producers engaged in the commodity sector in most countries preclude any further reduction in their income as a result of internalization measures. In developed countries, if necessary those negatively affected by internalization measures can be compensated by transfers from the state budget, but this may be impossible in poor countries.

17. The distributional implications of internalization measures are very important in developing countries because poverty alleviation and improved income distribution are not only among the top objectives of developing country Governments but also bear directly on improvement or deterioration of environmental conditions. When they have significant negative effects on income, some internalization policies, if not accompanied by appropriate measures, may backfire, particularly in developing countries where the "income constraint" is a significant impediment to such policies.

18. Internalization instruments have both "wealth/income effects" and "substitution effects". For example, charging producers a higher price for an environmentally harmful input may exacerbate rather than correct the externality. A tax on an environmentally harmful input changes the relative price structure of inputs which may be used for the same purpose. For example, in response to a price increase in chemical pesticides, producers use less of them. They may use more labour-intensive methods and turn towards more environmentally friendly IPM processes, as exemplified in the Indonesian case above. This is the substitution effect. However, the tax also decreases a producer's real income and, as a consequence, his propensity to environmental preservation. If internalization leads to increased poverty, then soil and water conservation in particular and other income-elastic environmental activities will be cut back.[4] Falling income in the wake of declining cocoa prices since the mid-1980s, for

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[4] Broad, based on a country case study on the Philippines, questions the conventional view that the vast majority of the poor are short-term maximizers - forced to degrade in order to survive - and, by definition, cannot think of the future. The author distinguishes between the "merely poor" (in general peasants with secure land tenure who are environmental sustainers) and "landless and rootless" who have only very few disincentives to cut forest cover, consume wildlife, etc. In the Philippines there is a great number of environmental activists among the poor (Broad, pp. 813-818).

example, prompted Brazilian growers to replace cocoa plantings by other land use, chiefly pasture for grazing which threatens the Atlantic forest ecosystem. Some growers sold timber from their forest reserves to pay off debts (UNCTAD, 1993a, p. 23). The income and substitution effects thus work in the opposite direction, so the net effect of internalization policies is ambiguous (UNCTAD, 1995a, pp. 12-15). Thus, while in developed countries internalization is in large part a matter of "getting the prices right", in developing countries the income effects of internalization policies may be as significant as price correction (UNCTAD, 1995b, p. 4).

19. Retraining, compensation for impacts, gradual implementation of instruments, grandfathering of old or small producers, and revenue neutrality (commensurate reduction of other taxes/levies or the granting of subsidies) are some ways in which the distributional impact of internalization instruments can be mitigated. These countervailing instruments have, however, to be designed in a way that does not jeopardize the desired incentive effect of internalization. Revenue-neutral internalization policies eliminate the income effect, allowing the substitution effect to redress the environmental externality. In practice, the design and implementation of revenue-neutral policies has often proved difficult. The example provided in box 4 illustrates one way of approaching revenue-neutrality. Another was applied in Malaysia, where planters and cultivators of oil palms (who bore about 84 per cent of the total industry costs caused by water effluent fees for palm oil mills) received some compensation by using palm oil mill effluent as fertilizer, eliminating the purchase of chemical fertilizers and also, presumably, having positive environmental effects (Khalid, 1995, p. 13).

20. In developing countries where an underemployed labour force which often seeks employment in the informal sector is common, avoidance of unemployment and employment generation are important policy objectives which need to be taken into consideration while selecting and mixing internalization instruments. In this context, positive employment effects can be generated by environmentally preferable agricultural production methods which make less use of synthetic inputs and are generally more labour-intensive. Moreover, because of the relative abundance of their labour supply, developing countries have a comparative advantage in products so produced, such as organic crops.

B. The burden of non-internalization

21. Any country, including developing countries, bears a heavy burden through not internalizing. Developing countries tend to focus on domestic externalities affecting productivity and health today and in the near future because of their high discount rates and low income levels and the corresponding relatively low priority attached to environmental amenities and the avoidance of distant (in time) damage (Panayotou, 1995, p. 15). Whether accorded priority or not, however, these costs exist and are borne, primarily by the civil society in the countries concerned.

22. Many empirical estimates of environmental costs have been undertaken. They are not fully comparable, but indicate that, in developing countries, costs borne by the society as a result of environmental damage can reach up to 17 per cent of GDP (Kox, 1995, P. 10). In general, such damage represents a considerably

smaller proportion of GDP in industrialized countries.

23. Some estimates of specific environmental damage in agriculture include the following. In Argentina, the cost of replacing nutrients lost through erosion amounts to $5,000 million per year. In Java, costs associated with irrigation system siltation is about 15 to 20 per cent of operation and maintenance costs. In the Punjab region of India, it is reported that groundwater is used at about 15 per cent above recommended levels in rice-wheat rotation and that a typical farm's operating costs would triple over 25 years owing largely to the need for progressively larger pumps to obtain water from a falling water table. Surveys conducted in 1988 and 1989 by the Nicaraguan Ministry of Health show that 12 per cent of small farmers in the country's principal agricultural region reported being poisoned at work. In El Salvador and Guatemala, intensified use of phosphate-based fertilizers is responsible for 400 worker deaths annually (UNCTAD, 1995a). In the United States, "about 10 per cent of all energy used in agriculture is spent to offset the losses of nutrients, water, and crop productivity caused by erosion... the total cost of erosion from agriculture in the United States is about $44 billion per year... This erosion cost increases production costs by about 25 per cent". (Pimentel, et. al. 1120-1121).

24. Mining activities also create environmental problems in the form of air and water pollution. Estimates of the magnitude of these effects, particularly in developing countries, are scarce. Research underway for UNCTAD (UNCTAD, 1995g) indicates that in the Witbank area of the Republic of South Africa, "the Department of Water Affairs is treating water from 10 abandoned mines at a cost of R 28 million (about $7,7 million) per year, which is absorbed by the tax base". In Eastern Transvaal, approximately R50 million (about $13,8 million) per year is spent in clean-up efforts by the state of diffuse pollution which cannot be traced to sources. In the same region, over 21,000 hectares of high-yield agricultural land may be irreversibly affected by mining activities.

25. The costs so identified in agriculture and mining are the costs associated with not internalizing. In many cases, internalizing them could be achieved by the removal of wrong incentives because the present structure of the economy is the legacy of the price and incentive system that has existed in the past. Research carried out for an UNCTAD/UNEP Workshop (Panayotou, 1995, pp. 13-14) noted that investments in infrastructure, plant and equipment, production technologies, consumption and trade patterns, property values, and even lifestyles and attitudes have all capitalized on the environmental or external cost subsidy that has been accorded to them for decades by the failure to internalize. Accordingly, a "big bang" approach to shifting from the current gross underpricing of environmental resources to full-cost pricing would be disruptive both economically (given investments in place) and politically (given the vested interests). It would also be more costly than necessary, because the costs of transition, which are likely to be high in the short run, can be expected to fall over time as existing capital stock depreciates and the new policy of gradual movement towards full-cost pricing is capitalized into expectations, new investment, and property values. Such a policy could start from the re-internalization of private costs that have previously been externalized through explicit state subsidies and the introduction of internalization instruments at low but escalating rates.

26. An important advantage of removing environmentally harmful subsidies is that this action does not require the capacity to design new instruments. Furthermore, removal or reduction of these subsidies, which should have significant positive environmental effects, would also provide considerable savings in the state budget. There may be a need, however, for the introduction of remedial measures if this loss of subsidies causes socially undesirable burdens on some parts of society. In such cases, supplementary measures will be needed to maintain revenue neutrality and could be financed by budgetary savings, thus protecting those groups, such as poor farmers and poor households, that would otherwise be disadvantaged.

27. In principle, "gradual internalization on all fronts has several advantages over selective implementation of full cost pricing in some sectors and not in others, or of internalization of some externalities and not others" (Panayotou, 1995, p. 15). One problem with selective reforms is the possibility that, because of their very selectivity, they will result in relative prices and expectations which move further out of line with social opportunity costs and relative scarcities than was the case prior to the reforms. On the other hand, when the externalities are large, the likelihood of so seriously disturbing the relative price structure that social welfare is reduced may be rather remote.

III. The link between internalization and prices

28. The link between the internalization of environmental costs[5] and their reflection in the prices of products and services is a complex one. It is obvious that in order to have environmental costs reflected in prices, they have to be internalized. However, this necessary condition is not also a sufficient one: internalizing environmental costs does not necessarily mean that they will be reflected in prices.

29. Internalization initially acts on the supply side.[6] By giving the correct signals about environmental costs and resource scarcities to producers, it induces them to adopt environmentally preferable production methods. Given that, in general, environmental resources are underpriced, the initial short-term effect of internalization can be expected to be a rise in the costs of production.[7] For these costs to be reflected in prices, however, they must (in full or in part) be passed on to the consumer. The extent to which this can be done depends on several parameters, including those on the demand side.

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[5] For a recent and full review of internalization policies, see UNCTAD (1994a), also see de Castro.

[6] Internalization of environmental costs through the "polluter pays principle" will increase the financial costs borne by the producer. Internalization of these costs through the "user pays" or the "victim pays" principle, as well as the internalization of environmental benefits, will increase the producer's income, but not necessarily through prices.

[7] It is very important to note, however, that the long-term effects may be very different, as the increase in costs can already now, and increasingly so in the future as technology develops, be offset by improved production technologies.

30. As an illustration of the magnitude of costs that might be reflected in the prices of developing countries' exports, it has been calculated that OECD members would have incurred direct pollution control costs of $5.5 billion for their 1980 imports from developing countries if they had been required to meet the environmental standards then prevailing in the United States. If the pollution control expenditures associated with the materials that went into the final product had also been counted, the costs would have mounted to $14.2 billion in 1980 (Walter and Laudon). This should be considered in the light of the fact that industrial countries have generally been more successful than developing ones in passing into their export product prices the costs of environmental damage and of controlling that damage (UNCTAD, 1993c, p.7). Thus, in the case of exports from industrial countries, consumers, including those in developing countries, bear at least part of the burden. But in the case of exports from developing countries, the consequences of environmental damage are borne overwhelmingly by domestic residents and firms, principally in the form of ill health, reduced productivity and higher costs (Repetto, p.4). What are the reasons for this situation?

A. The nature of commodity markets

31. The responsiveness of quantities demanded to a rise in prices is a principal factor determining the extent to which internalized costs can be reflected in the prices of products and thus the distribution of the burden of internalization between producers and consumers. The smaller the decline in the quantities demanded as a consequence of a price rise (i.e. the lower the price elasticity of demand), the higher the proportion of costs will be which can be passed on to consumers and the lighter the burden falling on the internalizing producers.

32. The elasticity of demand is strongly affected by consumers' possibilities to switch to other sources if prices rise. In this regard, it is useful to separate the switching possibilities when the price of a commodity rises across the board and when the price demanded by a single supplier rises. In the first case, this switch can only be towards other natural products or to their synthetic substitutes satisfying the same needs. Examples in this regard include substitution between coffee and tea, aluminium and steel, cotton and synthetic fibres. Thus, from the point of view of the totality of the producers of a given commodity, only inter-commodity substitution is significant and plays a role in determining the elasticity of demand.

33. When all producers are taken together, i.e. when only inter-commodity substitution is relevant, empirical estimates generally find a low price elasticity of world demand for most primary commodities. For agricultural commodities these elasticities in the long and medium term are significantly less than unity, often in the range between -0.10 and -0.35.[1] For non-agricultural commodities, the elasticities are somewhat higher (between -0.4 and -0.6), but

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[1] For some individual commodities the long- and short-term price elasticities of demand have been calculated as follows: coffee: -0.1 to -0.3, cocoa: -0.12 to -0.2, tea: -0.1 to 0.3, bananas: -0.4, sugar: -0.04, cotton: -0.1 to -0.3, refined copper: -0.3, tin: -0.1 to -0.5, tropical timber: -0.16, and natural rubber: -0.1 to -0.2.

these values would still indicate that a substantial part of cost increases could be passed on to consumers. In the short run, elasticities are even lower, indicating an even greater potential to pass on cost increases if these increases occurred across all producers.

34. Price elasticities of demand for commodities are so low because many commodities, in particular staple foods or key industrial inputs, are difficult to replace. In the industrial sector, for example, material substitution usually implies re-tooling of plant and retraining of staff. Furthermore, as the competition between steel and aluminium amply demonstrates, in some cases the quality of competing commodities has been continuously improved and specialized,[9] making replacement likely only under very specific circumstances. Only when quality requirements are not overriding, prices of the traditional input commodity surpass a certain limit (determined by re-tooling and retraining costs) and the trend of rising prices is expected to continue for some time is inter-commodity substitution likely."[10]

35. In the case of individual countries supplying a given homogeneous product, competition from other producers of the same commodity is an important factor, i.e. individual suppliers face the potential for intra-commodity substitution as well. The elasticity of demand faced by an individual exporting country will therefore be higher than that faced by all of the producers together. Other things being equal, the smaller the market share of the country, the higher the elasticity of demand it faces will be compared to the overall market demand elasticity. An individual country, acting alone, will therefore find it more difficult to pass on to consumers cost increases caused by internalization than would be the case if all (or a large proportion of) producers acted together. If the country tried to do so, its export earnings would decline and it would lose market share to those not internalizing or those who internalize but have lower environmental costs to internalize."[11] In this regard, there is a legitimate fear of loss of competitiveness, as examined in some detail in box 1.

36. An important question which arises in the face of this reasoning is: what is the empirical evidence on the scale of such potential competitive losses? Very little evidence exists at present. Some evidence suggests that several developing countries have internalized environmental costs. However, they have not been able to reflect the increment in international prices. This was presumably due to the inability to do so in the face of intense competition. Malaysian palm oil mills, for example, have incurred pollution abatement costs for reducing effluent discharge, but the burden has been shifted backwards to farmers rather than forward to consumers because of the highly competitive nature of the world

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[9] The majority of modern steel varieties, for example, are only some five years old.

[10] For more information in this regard, see: Hoffmann and Zivkovic.

[11] An important point to raise in this respect is that the higher the costs an individual producer would have to internalize, the larger the environmental subsidy that is offered by this producer to the consumers if the costs are not internalized. This also means that the producing country's social welfare is correspondingly lower than it could be.

BOX N° 1 The competitiveness issue

The calculation of competitiveness simply in terms of unit production costs is not a good approach to estimating the likelihood of commercial success. Profitability (total factor productivity at the country level) is a much better measure that reflects both costs of production and sales volume. The latter, for example, might increase because of better quality or environmentally preferable attributes of the product. It can be argued that stringent environmental regulations can be a very efficient lever for encouraging both the development of new, less polluting and more efficient products and processes and searching for previously overlooked cost-saving opportunities to improve processes, reduce wastes, or redesign products (Porter, pp. 74, 87). Thus, higher pollution abatement and environmental damage/scarcity costs can be offset by the producer through lower private production costs or better (environmental) quality. However, findings of other research indicate that "improving environmental performance is not associated with better financial performance in subsequent years" (Levy, p. 62).

The nexus "incurred pollution abatement costs-competitiveness" has not been properly reflected in the debate on the impact of environmental measures on competitiveness. The pollution abatement costs incurred by companies are not uniform but vary (i) with the technology used by companies, (ii) with the cost-efficiency of internalization instruments employed, and (iii) with the environmental absorptive capacity of the country. Command and control measures, such as uniform technological standards, often ignore not only special characteristics of the environmental problem but also important differences among production units in scale, technology, the degree of depreciation of capital expenditures, location, and innovation potential. Thus, if flexible internalization instruments are employed, producers are likely to minimize abatement costs to meet targeted reductions in emissions. Moreover, at the international level, the diversity in environmental conditions leads to different national absorptive capacities for environmental damage which determines the level of emission reductions and their pace and thus the abatement costs for companies.

Also, calculations on the economic effects of environmental regulations often omit the damage that pollution and other environmental impacts impose on consumers and even on producers. Estimates of the economic effects of environmental regulations usually take care of the private costs of pollution abatement only but not the reduced social damage costs; ironically, some of the negative effects, such as increased health-care expenditures, are counted as increases in income and output. Thus, these calculations do not reflect the reduced social damage cost caused by internalization such as better health, lower chemical content in run-off water, etc. (Repetto, pp. 5 and 25). As a consequence, competitiveness measurements that include both the costs and benefits of internalization lead to very different conclusions.

The fundamental issue is whether it is correct, from a sustainable development point of view, to put the major emphasis on the costs to be incurred by a production unit. If the concern is on the initial effects of an internalization measure, for example pollution abatement, on the costs of a given mine or farm, there will be a certain increase in costs and a (possible) negative impact on this enterprise's competitiveness. But if the initial competitiveness was attained by using an underpriced or free environmental service that society would now value more dearly, the introduction of internalization measures amounts only to the reduction of a previous subsidy. For traded goods, the implication is that foreign consumers were previously being subsidized by the exporting country.

Ultimately, the sustainable development issue turns around how much utility the society obtains from its total resource base, including environmental resources (that is overall national efficiency or total factor productivity at the national level), rather than how many units of foreign exchange are obtained, unless the country is under a severe foreign exchange constraint and the value (shadow price) of foreign exchange is very high. It should be noted, however, that this latter condition is indeed often met in developing countries, although only rarely in developed countries. In cases where international competitiveness is likely to be harmed, therefore, internalization of environmental costs and benefits will be appropriate if social welfare is increased by the reallocation of resources more than it is reduced by the foreign exchange foregone.

In practice, there is wide divergence in environmental performance among similar production units, presumably all working profitably, in the same area of a developing country, in the same sector, on the same scale, and under the same regulatory framework. Recent data suggest, for example, that some fertilizer and pulp mills in Bangladesh have been found to be quite clean by international standards, while others are heavy polluters. Likewise, about two thirds of Indonesian pulp/paper mills were in compliance with regulations. One third of the plants would be in compliance with US standards which were several times stricter. A very important implication of these observations is that cost-effective pollution control and clean and competitive production is possible even in poor countries. (Wheeler, et. al. p.14).

oils market. As a consequence of this backward shift, internalization does not appear to have been particularly onerous to the processors of palm oil in Malaysia (see box 2).

BOX N° 2 Internalization and international competitiveness: Some country experience

Dahitri, the third biggest banana exporter in the ***Philippines***, responding to a consumer outcry in Japan two years ago against chemical-laced bananas, set up an experimental chemical-free farm of 42 ha in its 200 ha Vizcaya plantation in Davao del Norte, Mindanao. Only organic fertilizers are used and no pesticides are sprayed from planting to harvest. To prevent fungal growth on bananas, on its conventional farm Dahitri sprays fungicides once a month, but on its experimental plantation it shifted to using banana oil, a natural ingredient that delays infection. The labour cost in the environmentally friendly plantation is three times higher than in the traditional plantations. The higher annual yield in the agro-chemical free plantation, however (4,000 boxes per ha compared to 3,000 per ha in the conventional farm), leads to a total production cost which is only twice as high. This classical cost-benefit analysis has not taken into account factors such as the gains of rejuvenation of the soil and the reduction in chemical run-off to rivers (the former a long-term private cost, the latter a long-term social cost). Still, consumers are willing to pay double for chemical-free fruits, say market reports from the United States.

In the food processing sector of the Philippines, Lucena Dessicated Coconut Products (Ludesco), whose production generated significant waste and wastewater, launched a programme to improve process efficiency and reduce waste. Through this programme, coconut wastage reduced from 19% to 9% at a capital cost of P160,000 a cost that was recouped from savings in just 15 days. The company has also succeeded in reducing energy demand and wastewater generation.

In ***Malaysia***, oil palm cultivation was encouraged in the 1970s and 1980s with the intention of reducing reliance on rubber export. Palm oil output expanded rapidly and accounted for about 40 per cent of the increase in agricultural output during the 1980s. In the same period, however, the palm oil processing industry was responsible for more than 60 per cent of Malaysia's total water pollution load. The effluent caused serious depletion of dissolved oxygen and killed fish, prawns and crabs, which are important sources of nutrition and jobs.

Effluent abatement regulations were established in 1977 after two years of consultations with the industry. With a command-and-control approach, oil mills were required to reduce the effluent components, using Biochemical Oxygen Demand as a parameter, from 20,000 mg/l in 1977 to 50 mg/l in 1986 (a reduction of 99.75%!). Although Malaysia supplies about 80 per cent of the palm oil that enters the world market, refined palm oil has to compete with 16 other products in the world market of fats and oils (among which soybean oil is the closest substitute).

Malaysia's refined palm oil sector lost only 5 per cent of the value of output, and the crude palm oil sector lost only about 1 per cent of the value of production. Palm oil exports rose by 136 per cent between 1977 and 1988. Despite the highly competitive nature of the world oils market, internalization does not appear to have been particularly onerous to the processors of the Malaysia's palm oil industry. Processors seem, however, to have shuffled off most of the costs onto producers of fresh fruit bunches (FFB), the planters and cultivators of oil palms. FFB producers appear to have borne 84 per cent of the total industry losses during the abatement period, shaving away over 40 per cent of the value of production of smallholders and plantation owners, who were compensated to some extent by the provision of inexpesive fertilizers supplied as a by-product of effluent treatment. These findings demonstrate that internalization need not impair overall competitiveness, it may however significantly change the distribution of returns from trade, calling for compensatory/counteracting measures.

In the mining sector of ***Chile***, the REFIMET mine has developed a successful process to clean arsenic-rich concentrates. The process is so successful that, in addition to processing Chilean ores, REFIMET imports concentrates from the Philippines and Greece. An increasing proportion of this by-product, arsenic trioxide, is being exported to the USA at a profit.

Sources: Khalid and Braden; SUNS; UNCTAD (1994b); UNCTAD (1994c).

37. In another attempt to estimate the potential competitive losses in a hypothetical case in agriculture, a comparative static supply-demand model showed that internalization would lead only to small effects on market shares (UNCTAD, 1995b, pp. 5-10). Effects on export earnings would be smaller still. Even under the unlikely and very pessimistic assumption that one country unilaterally imposed a 10 per cent tax on some of its export commodities (without gradual introduction or any offsetting tax reduction or transition assistance) and there

was an elastic supply (e.g. 0.8) from competing countries that did not internalize (i.e. migration of pollution), the loss of market share would only be 7 percentage points and the loss in revenue would be 4 per cent. However, although this may be considered a small price to pay for environmental protection, in the economic predicament that many developing countries find themselves, even this may be a very heavy burden. If half of the producers were to impose the tax, each of them would still lose market share, but their export revenues would increase because of a general rise in price.

38. The readiness with which competing (and non-internalizing) producers will increase their supplies affects the market share that will be foregone by the internalizing country. The higher the supply elasticities of competing producers, the larger the potential loss in market share. The intensity of competition between exporters can be measured by the supply elasticities. Estimates of these elasticities support the hypothesis of competitive international commodity markets.[11] Only for cocoa and rubber were the supply elasticities found to be below unity, hinting at less sharp international competition among suppliers of these commodities.

39. A further point to note is that, if the possibility to differentiate the product produced by the internalizing country exists, some of the risk associated with internalization can be eliminated. This issue is discussed in some detail in chapter IV.

40. Even if export earnings are foregone as a result of internalization, this may not represent a major problem for the country if the earnings do not account for a major part of the total export revenues. In this case, and from the point of view of the country as a whole, the burden associated with the inability to pass cost increases fully on to consumers will be more bearable. However, it remains the case that certain individual producers will be hurt.

41. In order to have an initial idea of specific cases where unilateral internalization would be possible, i.e. cases where the possibility of passing on some of the costs to consumers is considerable and where losses to be borne as a consequence of that part of the costs not passed on to consumers might be acceptable for the country, Kox has undertaken a survey for 415 specific country commodity cases. In this context, it is necessary first to identify cases where countries have a relatively high share in international markets (larger than 10 per cent) combined with low dependence on the export of a particular commodity (up to 25 per cent). These would be cases where either opportunities may exist for unilaterally passing on domestic cost increases to international clients, if the demand and supply elasticities are favourable, or the burden on the country's economy of not being able to pass on these cost increases to consumers can be considered bearable. From the 415 cases examined by Kox, only 26, covering 12 commodities,[12] meet these criteria (Kox, 1995).

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[11] Kox summarizes the following long-term price elasticities of commodity supply: tin: 1.25 to 1.34 in Thailand and Bolivia, cotton: 1.8 for developed countries and 1.4 for Argentina, coffee: 1.1 for Brazil and 1.05 for Indonesia (Kox, 1995, pp. 14-15).

[12] These were natural rubber, groundnuts, groundnut oil, cocoa, tin, palm oil, bauxite, copper, oilseed cake and meal, bananas, phosphate rock and sugar.

42. A second step is to eliminate those cases where inter-commodity substitution is relatively easy. This causes vegetable oilseeds, oils and cakes, and sugar to drop out from the initial list of 12 commodities, leaving only five commodities: cocoa, jute, natural rubber, tea, and iron ore.

43. Lastly, eliminating those cases where intra-commodity competition is intense, only cocoa and natural rubber (for a more detailed look at the natural rubber case, see box 3) remain as possible candidates for unilateral internalization. Even for these cases, the conclusion reached needs to be interpreted with much caution, because it is highly dependent on the measurement of various elasticities whose values are notoriously difficult to calculate accurately. Much more research is needed in order to refine this very preliminary finding. Moreover, in the case of natural rubber, as discussed below, what happens with internalization in the synthetic rubber sector is of primary importance.

BOX N° 3 A promising case of internalization - natural rubber

Natural rubber is a primary commodity which stands to gain from internalization if internalization is carried out in the entire rubber industry. Moreover, any energy tax levied in developed countries which does not exempt petro-chemicals would provide a boost to natural rubber consumption. Even setting these factors aside, the economic variables prevailing in the natural rubber market are conducive to internalization.

The supply elasticity for rubber is below unity, hinting at less sharp international competition. Likewise, the price elasticity for demand is estimated to be significantly less than one (-0.13 to -0.46). Furthermore, rubber is among the five commodities (cocoa, iron ore, jute, rubber, and tea) where large international market shares held by the key producing countries are coupled with intermediate export dependence of these countries (the international market share of Thailand, Indonesia and Malaysia is about 70%, while natural rubber exports accounted for only 3.5% of the total exports of the three countries at the beginning of the 1990s). Consequently, unilateral attempts to internalize environmental externalities and pass on the environmental cost increase to world market customers appear feasible. While concerted action among producers is theoretically not imperative, it would nonetheless be desirable between the three main producing countries. Besides, cooperation with producers and manufacturers of synthetic rubber is necessary.

The elastomer market is dominated by two commodities, namely natural rubber - a natural and renewable commodity - and synthetic rubber - a synthetic, non-renewable, fossil-fuel-derived product - which, in some applications, are substitutes, in others, complements. Rubber consumption itself is dominated by one sector, tyre production, which accounts for somewhat more than half of elastomer consumption and about 60 per cent of natural rubber consumption. As for the factors that bear on demand elasticity, it is unlikely that the current share of natural rubber in the total rubber consumption of tyre production, which is about 50 per cent for all tyres (ranging from 20% for light car tyres to 60% and more for commercial vehicles) will change much. Likewise, it is unrealistic to assume that rubber can be replaced by any other commodity in tyre production in the foreseeable future, nor is it likely that tyres themselves are subject to replacement by a different product. Although the same cannot be said for the general rubber products sector (such as rubber thread, conveyor belts, rubber sheets, elastic rubber bands, engine mouldings, rubber cloth, footwear and medical goods, to name only a few products), a good number of rubber products appear very difficult to displace or replace. Furthermore, the stress characteristics of these products augur well for a high share of natural rubber.

UNCTAD is thinking about launching a work programme on internalization prospects in the rubber economy. The proposed work programme falls into three phases. Phase one places emphasis on the identification and measurement of malign and benign environmental effects in the production, manufacturing, and consumption of synthetic versus natural rubber. On this basis, environmental costs and benefits should be demarcated and appraised. The second phase aims at exploring the applicability of various internalization instruments at the country and regional level. Furthermore, this phase should consider the scope and the best ways for reflecting internalized environmental costs in international rubber prices. The third phase focuses on capacity-building to implement full-cost pricing in countries that may want to make progress. UNCTAD intends to convene an informal round table on internalization in the area of rubber, rallying producers, manufacturers, traders and consumers of natural and synthetic rubber, as a steering body with a view to guiding the work and enhancing transparency among all market agents.

44. The analysis above - which focused on unilateral internalization - has shown that the likelihood of reflecting internalized environmental costs in international commodity prices has to be reviewed in the light of the special circumstances of commodity markets, which are: (i) world demand for most primary commodities is price inelastic (i.e. inter-commodity substitution is low), which seems to offer ample scope for the reflection of environmental costs in international commodity prices if all (or most) producers internalize; (ii) many commodities have a high elasticity of supply, which leads to intense competition among producers and to the free rider problem as far as internalization is concerned; (iii) most commodity-producing countries depend significantly on the export of one or two products, while their international market share is often low; they are thus price takers, making it unlikely that internalized costs can be shifted to international clients; and (iv) in many commodity markets, primary materials compete with natural and synthetic substitutes; unless internalization in all three product groups proceeded in tandem, the reflection of increased environmental costs in international prices of primary materials would cause substitution away from the internalizing commodity.

B. The existence of synthetic substitutes

45. The existence of synthetic substitutes which can easily be substituted for certain natural products was mentioned above as one of the elements making the internalization of environmental costs in the commodity sector more difficult. The ease with which some of these synthetic products can replace the natural products calls for a comprehensive approach to internalization efforts which includes both types of products.

46. In several cases of competition between natural and synthetic products (e.g. fuels, rubber, packaging material), evidence suggests that the latter generate more negative environmental impacts during production, manufacturing, transport and consumption than the natural products. Moreover, many synthetic substitutes have profited from subsidies, for example for energy, which effectively externalized a part of the environmental costs of their production. If these costs were internalized, their prices should increase, thus opening the way for implementing internalization measures also in respect of the natural products. This would offset possible reductions in primary commodity demand because of substitution in the wake of cost internalization and subsequent potential rises in price.

47. Policy measures which have been promoted and which would have the effect of internalizing the environmental externalities in the production of substitutes, or limiting the availability of substitutes, often address global environmental problems, such as CO_2 emissions or disposal/traffic of hazardous waste. Such policies would lead to (i) a removal of externalized (subsidized) cost components of synthetic substitutes, and (ii) a restraint in the supply of another important source of substitution, namely secondary materials." Such

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" The mandatory ban of transboundary movements of hazardous wastes within the framework of the Basel Convention, for example, will make the trade of scrap in several heavy and base metals for recuperation purposes impossible. This may lead to regional shortages of feedstock material driving prices for primary base and heavy metals up.

measures often address specific environmental issues, but have important implications for relative prices between competing industrial inputs.

48. The introduction of a tax on energy consumption and the use of petro-chemicals in key countries producing synthetic substitutes, for example, would certainly have an important influence on the relative prices of products such as fuel, fertilizers and rubber and on the input mix of manufactured goods using inputs derived from petro-chemicals. Thus, environmentally preferable (or less harmful) products such as bio-fuels, natural fertilizers and natural rubber would stand to obtain a competitive edge in such a case, making the reflection of environmental costs in their international prices easier.

49. In Germany, for example, discussions are under way as part of the reform of the tax system to introduce a revenue-neutral but progressive energy tax (see box 4). An examination of the consequences of the introduction of such a tax on the competitiveness of natural rubber reveals the following.

50. According to the scenario put forward by the German Institute for Economic Research, the chemical industry would be among the hardest hit sectors in the German economy. As mentioned in box 4, the tax-induced increase in production

BOX N° 4 A progressive rise in energy taxes - A scenario for Germany

On behalf of Greenpeace, the German Institute for Economic Research (DIW) has examined the economic effects of an ecological tax reform, taking, as an example, an energy tax the revenue from which is returned to firms (i.e. in a revenue neutral form) as a reduction in employers' social insurance contributions and to private households as a per capita allowance ("eco-bonus"). The energy tax is to be imposed on fossil fuels and electricity, whereas other, renewable sources of energy are to be exempted from taxation. Levied in this way, the tax also concerns petro-chemical products, such as synthetic rubber and various agro-chemical products.

The energy tax is designed as a quantitative tax; sources of energy are subject to a uniform rate of tax per unit of energy content. This rate increases progressively over time. The tax rate is based on a fictitious "basic price" for all sources of energy of DM9 per giga-joule. It is set to rise annually by 7% in real terms. Thus the price increase per unit of energy is identical in absolute terms for all sources of energy. The price increase over a ten-year period would be 24% for regular petrol, 46% for household electricity, 96% for industrial electricity and 73% for household heating oil.

DIW calculations show that the energy tax leads to a considerable improvement in energy efficiency. Despite overall economic growth of almost 40% between 1990 and 2010, energy consumption is expected to fall by 21%. The tax triggers significant structural change. The price rises induced by the tax are sharpest in energy-intensive sectors such as iron and steel, cellulose, ground wood pulp, paper and cardboard, water, railway services and chemical products. Analysis of the net effects of the increased burden of energy tax and the compensation (reduction in employers social insurance contributions and eco-bonus to households) shows that costs tend to rise in the basic and producer-goods sector as well as for transport services. The burden can be expected to decline for products of the capital-goods industries, for traditional areas of consumer-goods production (leather products, clothing, musical instruments and toys), for government services, for most private services, post and telecommunications, wholesale trade and construction. Two of the sectors hardest hit are the iron and steel industry and the chemical industry (the ten-year price rise for the former is put at 19%, for the latter at 7%).

The tax scenario shows that the effects of the reform on economic growth and collectively agreed wage trends are minor. Over a ten-year period, employment increases by 600,000 in the wake of structural change. As far as income effects are concerned, the DIW reckons that households with lower incomes face a reduced net burden as a result of the tax reform.

Source: Kohlhaas et. al. and Barlow et. al..

costs would be 7 per cent for the entire chemical industry. The price rise for synthetic rubber producers can, however, be assumed to be much higher than 7%, as energy/raw material costs account for about 50% of total production costs, whereas in the chemical industry in general they account for only 5-6% of production costs (Barlow, et. al., p. 108). It is obvious from these figures that the energy tax would significantly widen the room for manoeuvre for reflecting internalized environmental costs in international natural rubber prices, in particular in the tyre market (which accounts for about 60 per cent of natural rubber consumption) where competition has become increasingly based on price, rather than technology (Financial Times, 6 March 1995).[17] Higher natural rubber prices, and possibly market shares, would not only provide a boost to the foreign exchange earnings of natural rubber producers but also facilitate the introduction of internalization policies in natural-rubber-producing countries (dealing with negative environmental effects of natural rubber production and processing in producing countries, such as rubber factory effluents and dust generation[18]). It would also encourage international cooperation with producers of synthetic rubber on approaches to internalization. Internalization in competing synthetic products can therefore become one of the most effective internalization and marketing tools for natural materials.

C. Agricultural subsidies

51. Programmes to support the agricultural sector, particularly those implemented in developed countries, include massive subsidies linked to production. Apart from leading to important environmental problems through the excessive use of external inputs and thus externalizing important environmental costs, these subsidies also have effects on the potential implementation of internalization measures in other countries.

52. Massive support for agricultural production in the developed world has led to the emergence of substantial surpluses of many temperate zone crops. These surpluses depress international prices and thereby make it more difficult for countries producing similar products to implement internalization policies and get all, or part, of environmental costs reflected in international prices. Thus, the removal of environment-harming agricultural subsidies in developed countries is an important first step to allow for the reflection of environmental costs in international prices by developing countries producing similar or competing commodities.

IV. International cooperation on cost internalization

53. The analysis in chapter II has shown that, in the light of income and foreign exchange constraints, internalization of environmental costs in the commodity sector would be feasible (i.e. affordable) for developing countries

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[17] Besides the price effect, an energy tax would also give a boost to the development and use of new blends between natural and synthetic rubbers, some of which are already under study by a Common-Fund-financed project.

[18] For more information on the environmental effects, see: Wan; also Jones.

if increased environmental costs were reflected in international commodity prices and this price increase did not lead to reduced foreign exchange earnings. If, however, as the discussion in chapter III has shown, the increase in international commodity prices is likely to lead to declining commodity demand, other arrangements would clearly need to be considered. Likewise, if the reflection of internalized environmental costs in international commodity prices failed to materialize, international cooperation and assistance would be needed to enable developing countries to implement internalization measures, which represent an essential element of sustainable development policies.

54. This cooperation could take many forms and include cooperation among countries producing the same or substitute commodities, as well as cooperation between producers and consumers. Moreover, technical and financial assistance could be provided, principally by the developed countries. Regarding such assistance, the resources thus transferred could be considered to reflect the share of the internalization burden that would fall on the consumers had the producing countries been able to internalize and reflect this in prices.

55. In the rest of this chapter, the report analyzes the conditions under which international commodity prices can be made to reflect internalized environmental costs. It also suggests possible measures to be undertaken so that internalization can be operationalized when international commodity prices are unlikely to reflect increased environmental costs or when these costs are reflected but would lead to a decline in commodity demand and export earnings.

A. *Ways to make prices reflect internalized environmental costs*

56. The approach to this issue needs to be based on the observation discussed in chapter III that for many commodities, inter-commodity substitution is not a major problem, but that individual countries which want to undertake internalization measures face intense competition from other suppliers of the same product.

1. Cooperation among producers

57. To implement full-cost pricing and make international commodity prices reflect internalized environmental costs, exporting countries could, in principle, conclude an agreement among themselves, in which the co-operation of commodity-importing countries would not be required. This could be done by unilateral agreements among producers to fix minimum common norms for environmental quality in the various production regions with a view to phasing out particularly damaging production methods. Such agreements could include the commitment to maintain certain environmental standards during the production process or even the application (or banning) of certain technologies.[11]

58. Experience suggests, however, that in many cases such agreements would be rather fragile. In order to be successful, these arrangements would need a

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[11] According to GATT rules, mandatory process or production methods (PPMs) may not be imposed by importing countries. Exporting countries, however, are free to do so. For a detailed discussion of this issue, see Kox, 1993.

critical mass of market power and thus demand the adherence of a certain number of producing countries. These countries, however, differ in their ability to abide by the rules of the agreement in the light of foreign exchange or budgetary constraints.

59. Nevertheless, cooperation among producers would be more feasible in cases where the environmental costs to be internalized were similar across the interested countries. This condition is more likely to be fulfilled the smaller the number of such countries. And success in passing on the costs to the prices of the product is more likely, the larger the part of the market supplied by them. The availability of identifiable technical options to deal with the problems could also facilitate cooperation.

60. In cases where such an agreement among all producers seems possible, importing countries can assist significantly by eliminating, or undertaking a firm commitment to eliminate trade barriers to which the given product may be subject. Although such elimination of trade barriers would have been triggered by a change in the production and process methods, it would not violate PPM rules because it would not be differentiating among different producers of the same product. In effect, all producers would be producing under environmentally preferable conditions. The risk of "free-riders" in such an agreement would be substantial.

2. Differentiation of products

61. In competitive markets, homogeneous products fetch similar prices. A very important problem of commodities, sold on competitive international markets and produced by a large number of producers under widely different environmental and other conditions, is that it would be very difficult to identify an overall price premium for internalization. Even if this premium were identified and consumers accepted the need to pay it, it would be problematic to know whether this premium was indeed the result of internalization or served as a facilitator in this respect.

62. One channel by which environmental costs might be reflected in international commodity prices is product differentiation. However, the homogeneous character of most commodities makes demarcation problematic. If products which resulted from production processes where environmental costs have been internalized were easily identifiable, for example visually, the realization of a price premium could be easier. In reality, the physical characteristics of products produced in an environmentally preferable manner can be inferior from the point of view of the customer. Thus, unless they are sold on specialized markets, rather than obtaining a premium they may face discounts. A similar problem arises in the context of quality criteria. A study prepared for UNCTAD stated that "quality control standards reject coffee beans with even very low levels of borer attack, for example. Coffee producers find they will be recompensated for flawless products, and end up applying pesticides in a preventive fashion and above recommended levels" (UNCTAD,1993b, p.44), with the consequent environmental hazards.

63. In order to realize product differentiation, certification schemes can play

an important role,[18] and various such schemes are in operation. In the case of organic products, for example, there are voluntary certification schemes, such as the one of the International Federation of Organic Agriculture Movements (IFOAM) or the Codex Alimentarius of FAO/WHO or the ECO-OK of the Rainforest Alliance, and mandatory schemes, such as the US Organic Food Production Act and EU Council Regulation 2092/91.[19] The Rainforest Alliance in the United States is working with 15 Chiquita (Cobal) farms in Costa Rica which produce according to the standards set by the Rainforest Alliance in order to obtain the ECO-O.K. seal of approval.

64. Despite the overuse of pesticides associated with quality concerns in the mainstream markets as mentioned above, coffee is currently one of the most important organic items produced and exported by developing countries. Organic standards are increasingly combined with fair trade criteria in coffee trade. It is estimated that, in the case of Max Havelaar coffee, about 30 per cent of the price premium is attributable to environmental and 70 per cent to social advantages. There is a long way to go, however: fair trade coffee accounts for only about 2-4 per cent of the German, Swiss and Dutch coffee markets, whereas coffee grown under strict organic conditions represents only 0.1 to 0.2 per cent. The scale of the possibilities inherent in this approach may, however, be judged from the fact that Max Havelaar coffee alone, with only its very small market share, guarantees higher prices for some 300,000 small coffee producers in some 13 countries (UNCTAD, 1995e, p. 16).

65. According to various surveys in Europe, North America and Japan, consumers are prepared to pay a price premium of 5 to 10 per cent for environmentally preferable products. About two-thirds of the people interviewed would regularly buy such products. A very significant expansion of this market could be obtained if corporate consumers and government (and intergovernmental) procurement agencies adopted preferential guidelines for such products. In the United States, government procurement accounts for about 20 per cent of total consumption of goods and services. The US Government has already established environmentally based guidelines for procuring, inter alia, environmentally friendly paper products and building insulation material.

66. The above measures are likely to facilitate the passing on of higher environmental costs to consumers or, if prices did not rise, they would lead to an increase in market share of environmentally friendly products. Both are socially desirable outcomes.

B. The provision of finance for environmentally preferable production

67. If prices of products fail to reflect the internalized costs or such reflection leads to a decline in foreign exchange earnings of developing countries which are under income and foreign exchange constraints, arrangements including the provision of finance would be called for. Mechanisms which lead to subsidizing the development of, and access to, environmentally friendly

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[18] For a discussion of ecolabelling issues, see UNCTAD 1994d, UNCTAD, 1995f.

[19] For more information, see: UNCTAD, 1995e, p. 17.

methods of production would also help in preventing the undercutting of prices between producing countries through continued use of cheaper but environmentally damaging production methods. Such subsidization and the provision of finance for the design and implementation of internalization measures in general could be regarded as compensatory finance for damage inflicted by those environmentally unsound methods of production which made possible the low costs of primary commodities (in itself, as explained above, a form of subsidy of the South for the North).[20]

68. The provision of finance for environmental purposes has often been mentioned in the context of demands by the industrialized countries for changes in the way goods are produced in developing countries. For example, in a joint letter to the Dutch Parliament, the Ministers of Housing, Spatial Planning and Environment and of Development Cooperation stated: "if the industrialized countries ask developing countries to restrain their use of the environment utilization space to a level lower than was and is common in the Western world, they will have to offer them compensation in the form of additional finance and/or transfer of technology" (Linnemann, et. al., p.17). There is, however, no difference in principle between compensation for restraint in the use of environmental space when such restraint is the outcome of requests from the developed countries and when it is the outcome of a voluntary decision by the developing countries, as would be the case if these countries decided to implement internalization measures and apply environmentally preferable production methods.

69. Providing finance for environmentally sound processing methods or products would appear to be the most promising avenue of international cooperation in this context. An example in this regard is the Multilateral Fund established under the Montreal Protocol and designed to meet incremental costs of developing countries through technical assistance, technology transfer and training. The planned yearly contributions were as follows: 1991 US$ 53,3 million, 1992 US$ 73,3 million, 1993 US$ 113,3 million, 1994-1996 US$ 510 million (UNEP, P. 21). It is, of course relatively easier to generate finance in cases where the environmental problem is global. In the case of commodities, this would be the situation as regards the preservation of tropical forests, where a financial transfer can be considered as a payment for environmental services rendered. Concerning strictly local environmental problems, as was mentioned above, finance to facilitate their solution could be envisaged as corresponding to the payment which consumers would have had to make if the exporters had successfully internalized environmental costs and part of these were reflected in the prices of products.

C. Institutional arrangements for cost internalization

70. International cooperation needs to bring together: (a) producers of a given product facing similar environmental costs that they would like to internalize (this will facilitate alleviation of concerns about the loss of competitiveness);

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[20] The "user-pays" principle here takes the form of the "pay the non-polluter" principle, which means that the consumer of a product or user of environmental amenities pays the polluter for pollution prevention.

(b) producers and consumers of a commodity in arrangements that facilitate the shifting forward of cost increases that may arise from internalization; (c) producers of a raw material and its processors (this may facilitate the sharing of cost increases); and (d) producers of a raw material and producers of natural and synthetic substitutes.

71. Institutionally, the provision of finance could assume two forms: (a) commitments (within the context of informal, but regular, round tables involving commodity producers, processors and consuming countries) by commodity processors and consuming countries to provide finance, technology and necessary information to producers to help them in gradually adopting environmentally preferable production methods, and (b) the conclusion of formal agreements creating a compensation fund from financial contributions by commodity-importing countries. In either case, international co-operation in this direction would require transparency and exchange of information for the selection of environmentally sound technologies and verification of their adoption and use.

1. Informal commodity round tables on internalization

72. There appears to be much merit in voluntary commodity/industry round tables leading to commitments by producers, processors and consuming countries. Self-imposed industry schemes have the advantage of being easy to monitor and generally cost-effective. The amount of compensatory finance envisaged should not deter processors and consumers, as it could be confined to short-term bridging finance covering the period of transition to the full adoption of environmentally preferable technologies taking into account foregone export earnings as well as the costs associated with the introduction of such technologies. Information is a vital ingredient in selecting environmentally preferable production methods, in replacing harmful inputs and in assessing potential trade-offs between more or less environmentally harmful products and production processes. In a scheme self-executed by industry, it could be easier than in a formal agreement on a compensation fund to ensure the necessary flow of information. Assistance and exchange of experience in this respect are vital for reducing the burden of internalization of environmental costs for everyone concerned.

73. A further inherent advantage of an industry-wide round table would be the inclusion of producers of natural and synthetic substitutes. In some sectors, as illustrated in box 3, this is of crucial importance for passing on higher environmental costs.

2. Formal agreements

74. So far as formal agreements are concerned, international commodity-related environmental agreements (ICREAs) have been proposed as one solution to temporarily and partially relieve the international competitive pressures among the primary commodity producers, so that exporting countries can pursue a gradual transition towards ecologically sound production methods (Kox, 1995). The eventual form of an ICREA would need to be adapted to the market situation, production conditions and production cost structures for the commodity concerned. Two basic variants of ICREAs have been proposed by Kox. The first one is a standard-setting variant; it is an agreement between countries to apply common

(minimum) standards with regard to production technology. The second variant is a transfer ICREA with a financial compensation mechanism. It would operate through a compensation fund, fed from agreed contributions from importing countries.[21] In both cases the agreements would be created for a sufficiently long period of time to allow the majority of LDC exporters to adopt environmentally preferable production methods. These methods would gradually become the standard for determining producer prices, and the agreement mechanism would ensure that higher producer prices are adequately reflected in international prices. Such agreements would therefore have a built-in mechanism for self-phase-out. (Kox, 1995, p. 20).

D. Preparatory work for cooperation

75. Regardless of the channel through which costs would be internalized and environmentally preferable methods adopted, and regardless of the type of international cooperation envisaged, a number of steps would need to precede action. These would comprise (i) the identification of the environmental costs that the producers would internalize, (ii) the cataloguing of the available options, including the potential technologies, (iii) the assessment of the effects of internalization on production costs and volumes, as well as on other socioeconomic variables, and (iv) the estimation of international trade effects, preferably under different international cooperation scenarios. International organizations, including UNCTAD (where considerable relevant research is already underway both independently and in collaboration with UNEP), UNDP, FAO, UNIDO, the World Bank, the Common Fund for Commodities, and the international commodity organizations, as well as academic research undertaken independently, can provide substantial contributions in this regard.

76. Concerning (i) and (ii) above, considerable research is under way by various researchers and institutions, but the potential synergies are not fully exploited. There is also ample evidence that environmentally preferable production methods exist. What is lacking, however, is research on what the economic and social impacts will be of switching towards these methods, as proposed in (iii) and (iv) above.

77. With regard to internalization by the producers of a given product facing similar environmental costs, preparatory work could proceed along the following lines: the developing producers of a commodity could identify the main environmental externalities that need to be internalized. This could lead to the identification of constraints to internalization in the specific context concerned. These constraints could be classified in three sets, namely those that the developing producers can solve by themselves, those that require cooperation with producers of natural and synthetic substitutes, and those that necessitate collaboration with processors and consumers, as well as Governments in consuming countries. Focused, targeted and sequenced discussions could then follow in either formal or informal settings, as described above.

78. At the initiative of producers', processors' or consumers' associations,

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[21] Levies on commodity consumption or trade in the order of 3-10% of the trend price have been suggested.

UNCTAD could provide a forum for regular dialogue and could support the discussion with the required analytical and empirical analysis. This support, to be undertaken in close collaboration with other relevant organizations, could facilitate the dialogue of the round tables on negotiations by providing studies on environmental costs arising in different phases of production and consumption of commodities, the impact of specific internalization measures on costs and profitability at the micro level, as well as on income distribution, employment, foreign exchange earnings and government revenues.[27] Secondly, UNCTAD could undertake pilot projects in interested countries to design implementable internalization policies in the commodity sector that pay particular attention to the concerns of the country. Thirdly, UNCTAD could promote the exchange of experience among developing countries on internalization policies already implemented.

79. In the light of diverse experiences of developing and developed countries with internalization policies, the special circumstances of international commodity markets and the apparent conflict between societal gains and perceived risks of internalization, the Standing Committee may wish to keep under regular review developments in the area of internalization of environmental costs and their reflection in prices of natural-resource-based products and their synthetic substitutes, and to pursue a regular exchange of experience of individual countries in this respect.

80. As the natural-resource-based sectors are where many environmental costs and benefits are generated initially in the life cycle of products (and services) such a review and exchange of experiences could have important implications for policies and measures to internalize environmental costs and benefits throughout the rest of the economy. The Standing Committee may wish to have, as an explicit aim of its review and exchange of experiences, the identification of ways to facilitate and encourage a comprehensive multilateral approach to internalization which could alleviate the legitimate concerns of producers and consumers.

81. As The Economist recently noted, "international public goods are the things that every country values, but which no one country can realise fully on its own. Global free trade is a good example. Every economist will tell you that it makes sense for a country to liberalise its own trade even if nobody else does theirs; in practice, however, a framework of multilateral agreements has proved much the best way to carry this process forward. A clean global environment is another such public good...". (The Economist, 10 June 1995, p.19). A framework of multilateral discussions may be the most promising way forward towards achieving it.

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[27] In this regard, the analysis of revenue-neutral internalization instruments could receive special attention.

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